



Network Tool Analysis Framework (NTAF)

Brian L. Tierney
(bltierney@lbl.gov)
Jason Lee, Martin Stoufer
Lawrence Berkeley National Laboratory

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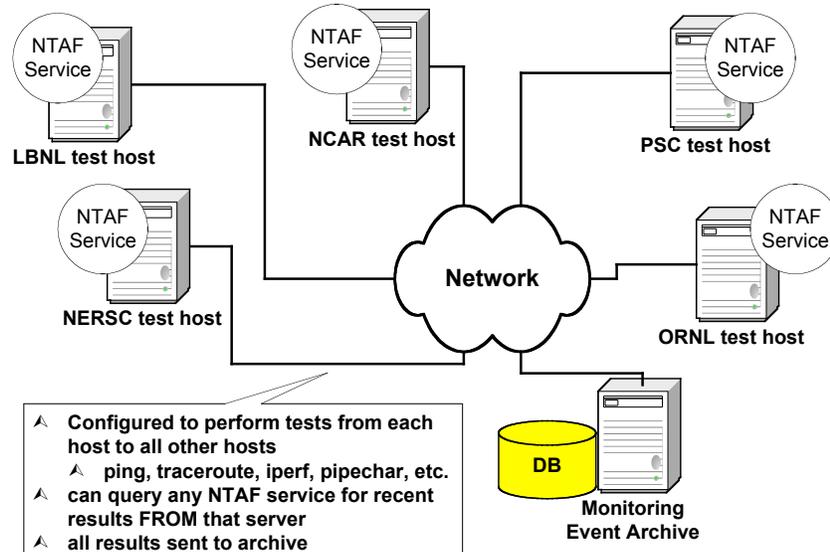
Network Tool Analysis Framework (NTAF)



- Configure and launch network tools
 - measure bandwidth/latency (*iperf*, *pchar*, *pipechar*)
- Collect and transform tool results into a common format
- Publication interface (GMA/OSGI)
- Save results for short-term auto-tuning and archive for later analysis
 - compare predicted to actual performance
 - measure effectiveness of tools and auto-tuning
 - provide data that can be used to predict future performance
- Use NetLogger to format and send data to archive

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NTAF Use Case



- The NTAF is configured to run the following network tests every few hours over a period of several days:
 - ping -- measure network delay
 - pipechar -- actively measure speed of the bottleneck link
 - iperf -- actively measure TCP throughput. Multiple *iperf* tests could be run with different parameters for the number of parallel streams {e.g.: 1,2,4} and the method of tuning the TCP buffers {Linux 2.4 auto-tuned, hand-tuned}
 - Netest: Jin's new network available bandwidth estimation tool
 - GridFTP: for testing WAD autotuning, etc.
 - pathrate/pathload: measure network capacity and available bandwidth
- All tools use the Web100 TCP-KIS interface to collect TCP information from the Web100 kernel, and then use NetLogger to format and send this data to the archive.

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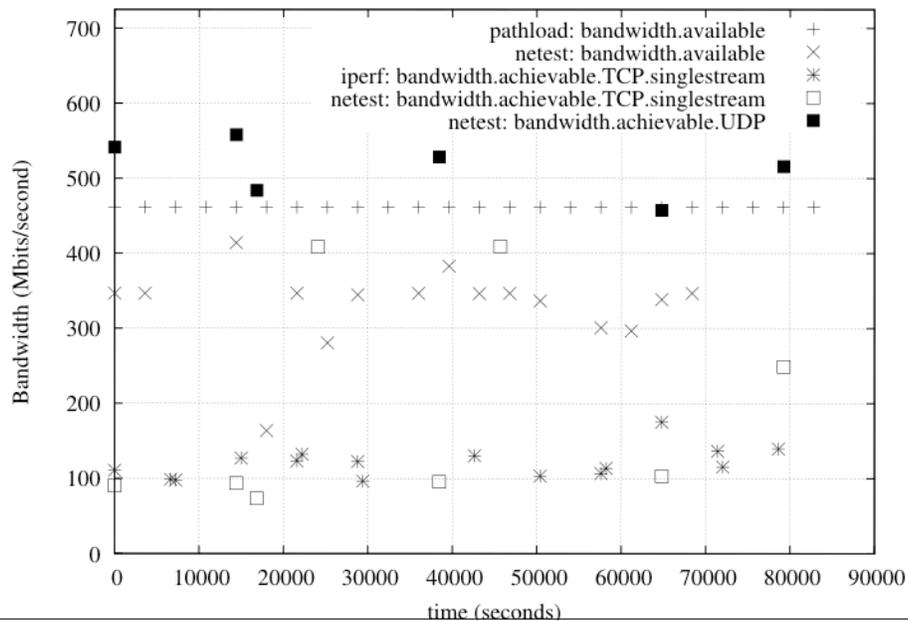
Use Case (cont.)



- Analysis based on this test configuration includes the ability to, for **ANY path** being monitored, do the following:
 - compare WAD tuned throughput to hand-tuned throughput.
 - compare *iperf* bandwidth with application bandwidth.
 - determine the advantage, if any, of parallel data streams, using both hand-tuned and autotuned (Linux 2.4-tuned) TCP.
 - analyze the variability of the results over time
 - compare *pipechar* - *pathrate* to see which is most accurate.
 - measure the impact of tuned TCP streams on non-tuned streams

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Sample Results

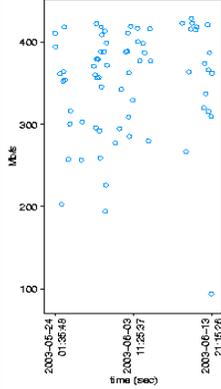


Sample Results

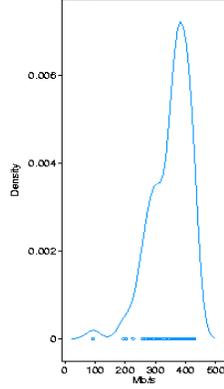


Tool A

bandwidth.available (20.8 days)

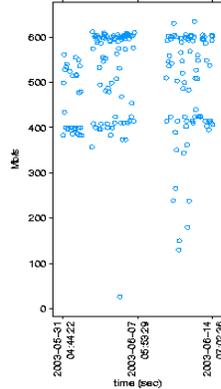


Densityplot

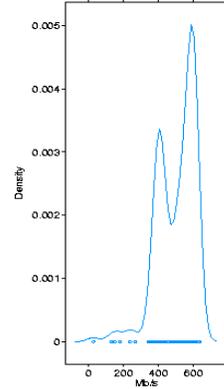


Tool B

bandwidth.available (14.1 days)



Densityplot



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The Problem



What to believe as the most optimum observation.

Use case:

Out of the last N observations of Network characteristic X, determine will yield the best results for decision □.

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Proposed Addition



In concert with the Measurement Methodology, a Measurement Rank is included.

•Motivation;

- . Different logic models may be used in a single test.
- . Tests may generate different modes of results.
- . Guaranteed reliability of a test to generate results.

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Proposed Addition



| <u>Measurement Rank</u> | <u>Measurement Methodology</u> |
|-------------------------|--------------------------------|
| Primary | FSE (URI?) |
| Secondary | Stochastic Estimation |
| Tertiary | Outside Source |

The Rank value will be well defined, while the Methodology will be as descriptive as the test designer sees fit.

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Justification



A measurement methodology does nothing to describe how reliable the observation is.

There is no apparent order of importance between unique methodologies.

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Conclusion



- Enumeration of the Measurement Rank will be the responsibility of the test developer.
- Quicker access to better data from a relational data stores.
- The end user or Network Entity provider will decide to use optimal observations.

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For more Information



- <http://www-didc.lbl.gov/net100/>

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